

Moreover, it would seem to be as though there had been a marked degeneration not only in the physical conformation of the pre-Bantu inhabitants of South Africa from the earliest Strandlooper type downwards, but also in the character and size of the stone implements manufactured by these primitive South African peoples.

Dr. Péringuey in some of his remarks (p. 168) would seem to regard the Bushman as not being a primitive race, but an example of retrogression in some directions and a singular advance in others. He puts forward the interesting hypothesis that the ancestors of the Bushman having discovered the potency of vegetable and animal poisons, gave all their attention to the manufacture and shooting of poisoned arrows, and therefore no longer cared to fabricate large stone weapons.

Dr. Péringuey writes as a South African, and South Africans are apt to hold heretical notions regarding the Bantu. One is that there is a Bantu physical type of negro, which is not the case; and the other is that the Bantu languages in their present form are of immense antiquity, and came to Africa from India. The Bantu-speaking peoples of South Africa vary in physical type, just as they do in the rest of Bantu Africa, and do not present any collective difference from millions of other negroes not speaking a Bantu language. As to this language family, I have given at different times reasons which appear to me conclusive for supposing that it cannot have originated in North Central Africa more than some 3,000 years ago. It was brought into existence in the heart of Africa, just like its neighbour Hausa, by the intrusion of some half-white race similar to the Hamite or the Fula.

This book gives interesting illustrations of the steatopygia and peculiarities of the external genitalia of the Bushman race.

H. H. JOHNSTON.

CALIFORNIAN TREES.¹

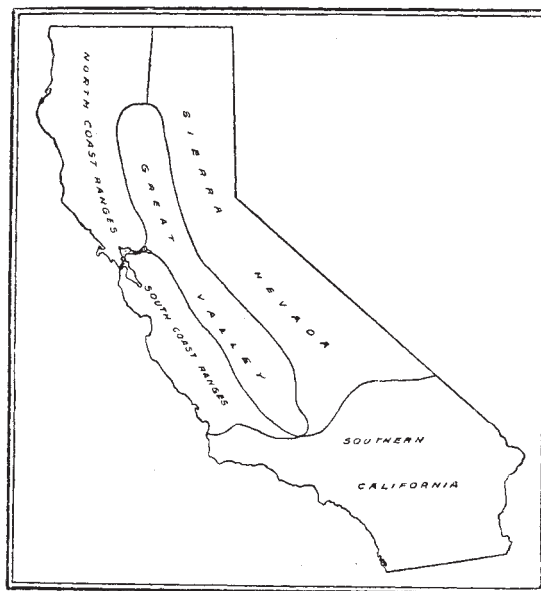
PERHAPS the noblest and most fascinating of all subjects for the writer and student of trees is the sylvia of California. The arboreal vegetation of no other area of similar dimensions rivals it in interest or in the size of its individual types. Three trees alone—the two Sequoias ("Big Tree" and "Redwood") and the Douglas Fir—give to it a unique distinction, and they are supplemented by a group of scarcely less wonderful pines, firs, and spruces. Whilst it is the immense coniferous trees that give to the Californian sylvia its remarkable fascination, many of the "broad-leaved," or non-coniferous, species are scarcely inferior in interest and distinction. There are, for instance, the magnificent Madroña—*Arbutus Menziesii*—a close ally of the Killarney arbutus, but reaching 125 feet in height, with a trunk 5 feet in diameter; the golden chestnut (*Castanopsis chrysophylla*), its leaves a tawny gold beneath, also over 100 feet high; the Mountain dogwood (*Cornus Nuttallii*), an ally of our Cornelian cherry, but often 50 to 60, sometimes 100, feet high, with its beautiful white involucre 6 inches across. Mr. Jepson, therefore, may well be congratulated on his subject.

To us in the British Isles it possesses an exceptional interest, because most of the Californian trees can be cultivated in the open air in many parts of our country. Nowhere else, indeed, out of California itself, can its coniferous trees be seen to such perfection as in the Perthshire valleys and in various places in the south and west of England and Ireland.

¹ Memoirs of the University of California. Vol. ii., "The Silva of California." By W. L. Jepson. Pp. 480+85 plates+3 maps. (London: T. Fisher Unwin; Berkeley: University Press, 1910.) Price 2l. 2s. net.

The history of the Californian sylvia as known to Europeans strikes one as curiously recent. Botanical knowledge began with the visits of the Malaspina and the Vancouver expeditions. The latter, a voyage of survey organised by the British Government, touched California about 1793. Most of the botanical work accomplished on this journey was done by Archibald Menzies, but he only penetrated a few miles from the coast. David Douglas visited and explored California in the interests of the Horticultural Society of London about 1827, and with him may be said to have commenced the real revelation of its sylvia. It was carried on by Nuttall, Fremont, Kellogg, Brewer, Bolander, and others. But even the existence of the "big trees" (*Sequoia gigantea*) was not definitely and authoritatively made known till nearly the middle of the nineteenth century, although hunters and wandering pioneers had previously brought home accounts of marvellous trees—mostly received, however, with the scepticism the stories of such folk obtain.

Among the later investigators of the Californian sylvia a foremost place is held by the author of this



The Five Forest Provinces of California.

volume. Only two years ago he published an admirable little book, "The Trees of California," of which the present elaborate work is an amplification. The new volume opens with an interesting essay on the remarkable topography of California, its climate, rainfall, and tree distribution. The two great mountain systems (the Coast Ranges and the Sierra Nevada) enclose a great oval plain known as the "Great Valley," drained by the San Joaquin and Sacramento rivers, which meet about midway, and empty into the Pacific. This region, 400 miles long and averaging about 50 miles in width, is sparsely wooded and weak in number of species. One peculiar characteristic of its scenery is the park-like grouping and disposition of a few species of oak, chiefly the Valley oak (*Quercus lobata*) and the Live oak (*Q. wislizenii*). They never form forests as the coniferous trees of the foot hills and mountain slopes do, and scarcely anywhere on this central plain does an aggregation of individuals amount to more than what may be termed a grove.

Besides the great valley of the Sacramento and San Joaquin, the author discusses his subject from the point of view of four other great geographical areas:

(1) the Sierra Nevada, the chief sylvan interest of which belongs to the long western slope, where occur the Big Tree groves, the eastern slope being remarkably abrupt; (2) the North Coast Ranges, a region rich in individuals and species, including the Redwood and many others which extend northwards into Oregon and Washington; (3) the South Coast Ranges, which form an interesting area richest forestally on the seaward slopes, where, among others, flourish the Redwood, Douglas Fir, and *Pinus ponderosa*. This region includes the remarkable peninsula of Monterey, where the well-known Monterey cypress of our gardens (*Cupressus macrocarpa*) is endemic; (4) Southern California, where the rainfall is deficient and the arboreal growth confined to mountain valleys and canons, and where, in many places, the vegetation is of a purely desert character.

Spread over these five forest provinces are the ninety-four species of trees which come under the author's purview. The whole essay, which is one of remarkable interest, is the result, as Mr. Jepson tells us, of nineteen years' travel and study in the field. The only criticism we would make is that the exclusive use of vernacular names renders it impossible to follow the author without a continual and rather irritating reference to the body of the work in order to ascertain what species it is to which he is alluding. Such names as "Interior Live oak," "Santa Lucia fir," convey no meaning to the majority of readers, and their general adoption (which the author is anxious to bring about), as well as the reader's convenience, would have been furthered by a citation of the botanical name as well.

The treatment of the individual species is admirable. A very full synonymy is given, and a copious list of references. After an adequate and not very technical description of the tree, the author discusses its geographical distribution, its history, economic value, and any other matter of interest concerning it. To the Redwood and Big Tree, ten and eight pages respectively are devoted, and the distribution of the latter is shown by two large maps. The book is illustrated by eighty-five full-page plates, many of them reproductions of photographs showing the trees in their native habitats, and, incidentally, characteristic bits of Californian scenery.

Mr. Jepson has the orthodox conception of a species, which is decidedly refreshing after the orgy of species-making his compatriots of recent times have indulged in. As presenting an original and authoritative account of a group of trees of particular interest to arboriculturists in the British Isles, his book may be strongly recommended.

W. J. BEAN.

IMPERIAL SURVEYING.¹

IN response to an invitation sent by the Colonial Office in March, 1909, to the Dominion, Commonwealth, State, and Provincial Governments in the Empire, delegates for the Commonwealth of Australia and the Dominion of Canada met in London in June last to discuss the proposal for establishing some system of reciprocal admission for surveyors between the different portions of the Empire. The question had been raised originally as a resolution submitted by the Government of New Zealand to the Colonial Conference of 1907, at which a memorandum drawn up by the council of the Surveyors' Institution was discussed, and a resolution was adopted affirming the desirability of reciprocity with regard to the examination and authorisation of land surveyors. The outcome of this was that particulars of examinations and other requirements with regard to the authorisation

of surveyors were obtained from several Dominions, and were coordinated and compared in a second memorandum by the council of the Surveyors' Institution, in which the desirability of a conference between those concerned was pointed out.

This conference recommends as a first essential the formation of a central board, which would use its influence to keep up a uniform standard of examination, and on which the different Governments of the Empire would be represented. All examination papers set in any part of the Empire under any scheme of reciprocity would be sent to the board, which would direct attention to any questions falling below the standard agreed upon, and would consider any proposals for improving the working arrangements for reciprocity. Further, a syllabus was drawn up for a preliminary examination in English, arithmetic, algebra, plane and solid geometry, plane trigonometry, and mensuration; and for another of more advanced type to be passed after two years' field service, and including practical and theoretical surveying up to secondary triangulation.

Though this may appear a slight basis on which to construct a scheme of imperial reciprocity in this direction, the complexity of the whole subject must be remembered. In the United Kingdom the Ordnance Survey has provided an accurate topographical survey of every portion, though a true cadastral survey indicating all property boundaries does not yet exist, and, according to the recent report of the Royal Commission on the Land Transfer Acts, is not recommended, since therein verbal description of boundaries is preferred, maps being used in all cases, but only for assisting identity. Consequently there is no profession of highly trained surveyors having an intimate knowledge and full experience of the most precise methods of land and earth measurement, nor is geodesy studied at the higher educational institutions as is the case on the Continent. A moderate knowledge of land measurement enables the necessary interpolations and additions to be made to an ordnance map, and a land surveyor's duties are very largely concerned with valuation. The Surveyors' Institution has arranged a special advanced examination in land surveying, but being of no great value at home, and not recognised in a colony, use is not made of it.

In the various colonies the conditions are wholly different, for large areas remain unsurveyed, the demand for the location of property boundaries is urgent, and in many cases the surveyor has no official control points to connect with, but must make his own survey self-contained. It is therefore necessary for the Governments of these colonies to insist upon a high standard of technical efficiency in land measurement, including an acquaintance with geodetic work in all its branches. With such very different conditions existing any arrangement for the free interchange of surveyors must be difficult, and the proposals now put forward may be a first step as providing a guarantee of a certain standard of efficiency which may in some Dominions, Provinces, or States require to be supplemented to qualify for their special certificates.

In the United Kingdom at the present time there is no place where higher surveying and geodesy are regularly taught to those who are already acquainted with the ordinary and more approximate methods, and an improvement in this respect would do much to enable a surveyor in this country, wishing to practise in the colonies, to acquire the additional technical equipment which is required by some of their regulations. But besides the self-governing colonies there are vast tracts administered by the Crown colonies, and in these administration and development are de-

¹ Report of a Conference on the Question of Reciprocity throughout the Empire in the Examination and Authorisation of Surveyors. [Cd. 5776.] (London: Stationery Office, 1911.) Price 2½d.